>CURSOR

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THE TINY MICRO COMPUTER NEWS SERVICE

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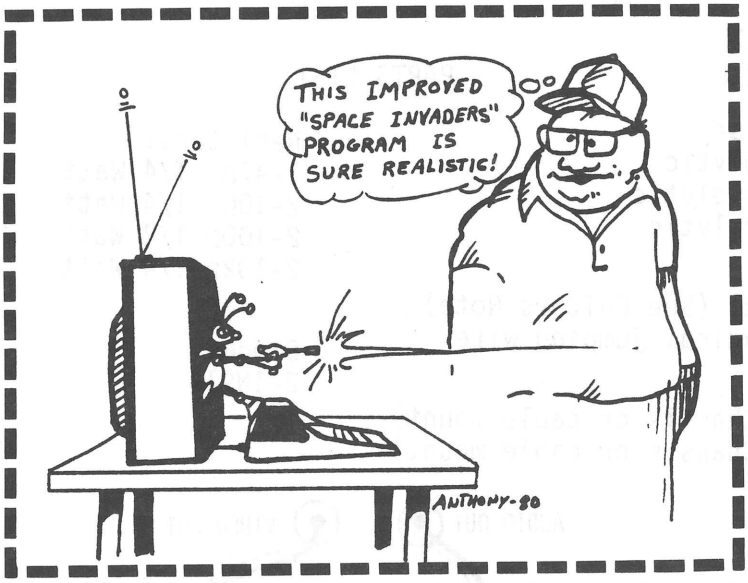
DIRECT VIDEO/AUDIO CIRCUIT

BY
PHIL MORTON
ADAPTED BY
TOM MEEKS
ASSOCIATE EDITOR (VIDEO)

This add-on circuit gives the computer user a line level audio signal output and a composite video signal output. It is a lowest-possible-cost solution to a highest-possible-quality goal. This circuit is designed for use with a commercial color monitor, care must be taken when attempting to hook this circuit to a non-isolated "home-brew monitor". The circuit was designed and prototyped by Dan Sandin; copied and documented by Phil Morton. For assistance contact Phil at (312) 666-5628, Chicago, Illinois.



For Bally Arcade Computer users who are not connected into the ongoing Sandin IMAGE PROCESSOR cybernet, you should probably simply collect the parts (See PARTS LIST) and wire-wrap this circuit or duplicate the design of the etched board presented in this article.

You can do a "neat" job by using either chassis-mount connectors, mounting them in the top plastic "fin" (see Editor's Note), or cable-mount connectors by enlarging the RF cable hole to run the audio and video cables out. We got away with using RG174/U (coax) for both audio and video.

If you remove the RF Modulator from your computer then the BNC Video Out will deliver black-and-white composite video only; no color. This may be desirable for special applications which assume colorizing "down-stream" in time (with RF Modulator reconnected, you get COLOR out!!)

Remove the five phillips-head screws on the bottom of the computer; the top plastic will now come off. Pull the RF Modulator off the 8 pin connector; solder to pins #1 (video), #2 (+10 Volts), #3 (audio). Pin #1 is closest to the heat sink and the front of the computer.

"...enjoy your clean pictures and sounds!"
Phil M.

EDITOR'S NOTE:

The circuit works very well as it is installed at this point. There were, however, some anxious moments.

1. I first used Radio Shack transistors as substitutes. Both the RF and Video outputs were about 60% of proper levels and completely unacceptable. The proper transistors will not cause a perceptible drop in RF Gain.

2. You MUST arrange all solder connections deeply on the RF Connector Pins. Otherwise, your soldering will not allow the RF Modulator to be reconnected.

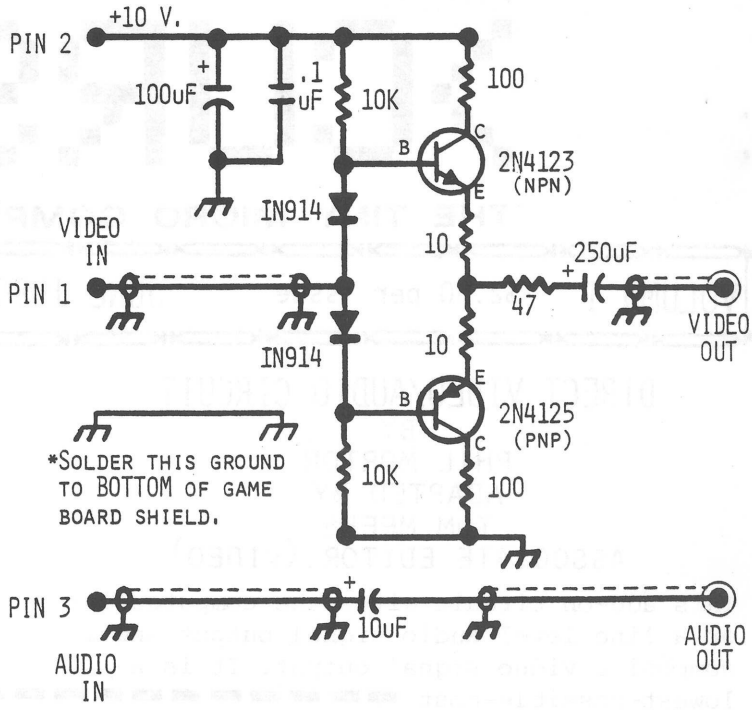
3. Mounting the board in the "fin" caused some problems with interference. Also, it was a pain in the neck! My solution was to provide a 4 pin socket (Radio Shack #274-002) on the back of the Bally unit. The leads from the chassis ground, audio, video and 10 Volts were attached to the

socket. The circuit board was then mounted in its own chassis box. Sony camera cable was used for the connections from the circuit board to the 4 pin connector (Radio Shack #274-001). Sony uses this cable to drive their B/W cameras using 6 pin DIN connectors. It is well shielded and easily available.

4. What you see with RF is definitely inferior to direct color video out of the Bally. What an improvement! Color bleeding is way, way down. The most noticable improvement is in the reduction of interference in the picture from the music synthesizer (using a Timebase Corrector improves it even more!).

FINAL NOTE: I would very much like to know if anybody knows how to drive one of these things with external sync. Please give us a call or drop a line.

T.M.



PARTS LIST

Capacitors:
1-.1µF 50WVDC Cer. Disc.
1-10µF 25WVDC Electrolytic
1-100µF 25 WVDC Electrolytic
1-250µF 12WVDC Electrolytic

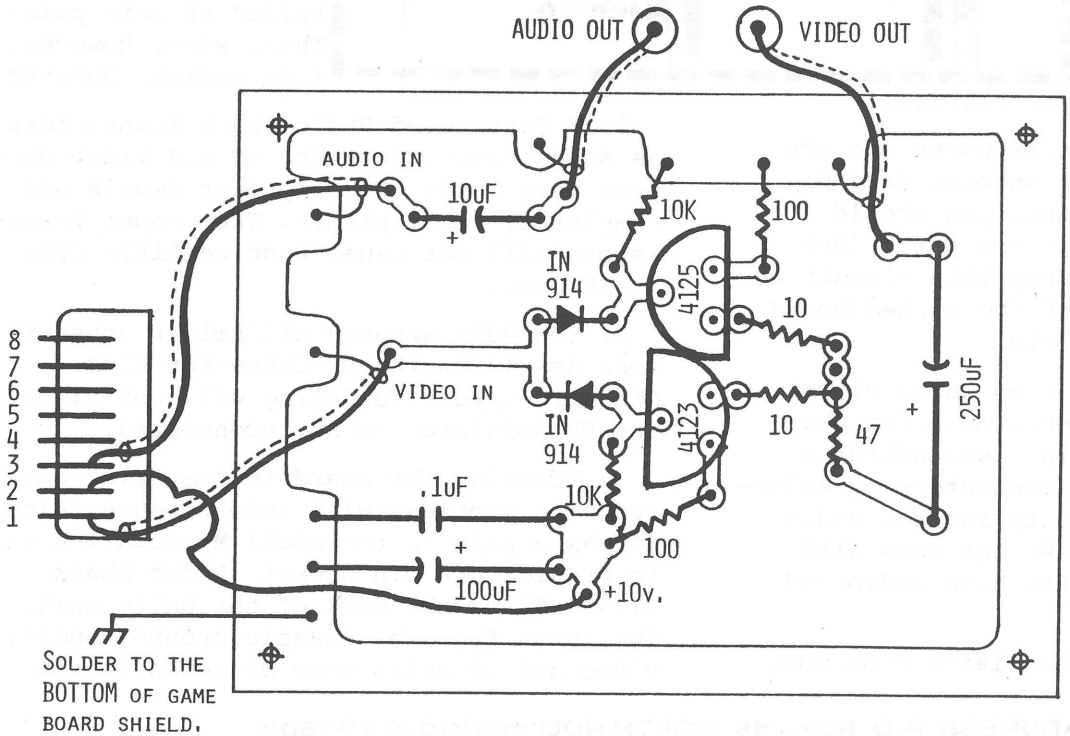
Wire/Cable
4-feet RF 174/U (coax) (See Editors Note)
2-feet Hook-up, grounding, jumping wire

Connectors:
1-RCA Phono-female (Chassis or cable mount)
1-BNC Video-female (Chassis or cable mount)

Resistors:
1-47Ω 1/4 Watt
2-10Ω 1/4 Watt
2-100Ω 1/4 Watt
2-10kΩ 1/4 Watt

Diodes:
2-1N914

Transistors:
1-2N4125 (PNP)
1-2N4123 (NPN)



RF MODULATOR
PIN OUT

Pin #8 = -5 Volts
Pin #7 = B-Y
Pin #6 = R-Y
Pin #5 = +2.5 Volts
Pin #4 = Chroma
Pin #3 = Audio
Pin #2 = +10 Volts
Pin #1 = Video

GALACTIBATTLE

BY

BRETT LATHROPE

Editors' Note: We have seen so many of this type of program (limited graphics) but, we feel this is one of the best non-graphic space programs we have tried! It is that much more remarkable to know that the author has only owned his unit for two months. We have taken a little literary license and made a few changes (color bar, etc), but have left the primary program as is. If you play within the rules, it can be a lot of fun...

Fred C.

You are a Galactica Warrior piloting an outward bound fighter on a critical search and destroy mission! You are the last hope of your civilization and must destroy all the Cylon ships located in your quadrant of the galaxy! Radio silence is imperative, to facilitate the silence, your battle computer will also operate silently.

All standard battle conditions apply, i.e., a carrier pilot rarily fires his weapons while lashed to the deck of the carrier; If a mistake is made, the results are usually costly; unnecessary flights burn excessive fuel; Mission aborts' (return to Galactica) should only be executed when there is no other decision available!

Your initial battle computer readout should appear thusly:

```
SHIELDS:        STRONG
FUEL:           1000
FIRE POWER:     150
CYLONS:         21 (Varies)
BASESTAR        200 (Distance from home)
STARDATE        88 (Varies)
ALERT STATUS              (Color Bar)
COMMAND:
```

The battle computer is now awaiting your instructions. Commands are as follows:

1 ADVANCE
2 RETREAT (Return to Galactica)
3 FIRE WEAPONS
4 TRANSFER POWER TO SHIELDS
5 TRANSFER POWER TO WEAPONS
6 TRANSFER POWER TO FUEL RESERVE
7 HAVE GALACTICA COME TO YOU (200 only)

Your mission must be completed within the number of Stardates (SD) you have been allotted; Commands use 1 star date each, except "RETREAT", which uses 1 SD plus 3 SD for Docking.

Your object is to search for Cylons, the computer will notify you if the enemy is in your quadrant, near your quadrant, or far away. This is accomplished by use of the "Alert Status Color Bar"; RED-Cylons are attacking; YELLOW-Cylons are nearby; GREEN-All clear.

FIRE WEAPONS: Maximum of 50 units per command; If you try to use more fire power than contained in your reserve, computer will ask if you wish to transfer power from fuel reserve. SPACE=Yes; ERASE=No; Pulling fuel costs 2 fuel unit for 1 fire unit.

DAMAGE CAUSED BY ENEMY:You can lose your weapons if hit while shield Power is low; You can be hit in the fuel tanks, and leak fuel. The more fuel tank hits, the greater the leak becomes!

NOTE: Brett mentions that he is not very proficient at string applications, etc., and would be very interested if anyone can save memory while still maintaining program integrity. Also, Brett has complied a more complete set of instructions. If you include a stamped self addressed envelope, hw will happily forward info to you. Brett Lathrope, 8311 Monique, Cypress, CA 90630.

KEY VARIABLES

A AMMO
B DISTANCE FROM BASESTAR
C STATUS ALERT CONDITION
F FUEL
J WEAPONS DAMAGE
K FUEL DAMAGE
S SHIELDS
T STARDATE
U DISTANCE OF THE CYLONS

PROGRAM EXPLANATION:

LINES	#'s	REMARKS
9-	10	Initialize
100-	180	Sets-up & Prints Status Report
	300	Out of Time (Stardates)
303-	355	Command Sequences
5000-	5003	Shield Condition
5005-	5008	Alert Status Color Bars
5070-	5077	Weapons Sequences
6050-	6054	Docking
9000-	9006	Damage Reports
9090-	9091	End of Mission Statements

NOTE: AS MEMORY IS WELL KNOWN TO BE LIMITED, ALL SAFEGUARDS WERE NOT PROGRAMMED. YOU CAN IN PLACES GET AROUND THE RULES,BUT REMOVE THE FUN.

```
  5 .GALACTIBATTLE
  6 .BY B.W.L.  5/16/80
  9 G=1ØØ; H=9Ø6Ø;I=1ØØØ;BC=1Ø;FC=8;&(Ø)
    =1Ø;&(1)=1Ø;CLEAR ;&(9)=95
 1Ø NT=Ø;B=2ØØ;GOSUB 6Ø6Ø;U=RND (5ØØ);GO
    SUB 5Ø2Ø;Z=RND (15)+1Ø;T=Zx3+25
 1ØØ CLEAR ;IF B=ØGOTO 6Ø5Ø
 12Ø PRINT ;PRINT " SHIELDS:",;GOSUB 5ØØØ
 124 IF F<1F=Ø
 125 IF K>ØPRINT " FUEL DAMAGE ",#1,F;F=F
    -Kx5Ø
 13Ø IF K=ØPRINT " FUEL:",#11,F
 135 IF JPRINT "WEAPONS DOWN!
 14Ø IF J=ØPRINT " FIRE POWER: ",#1,A
 15Ø PRINT " CYLONS:",#7,Z
 16Ø PRINT " BASESTAR:",#6,B
 165 IF T<1T=Ø
 17Ø PRINT " STARDATE:",#5,T;GOSUB 5Ø2Ø
 18Ø GOSUB 5ØØ5
 3ØØ IF T<1CLEAR ;PRINT " TIME!";GOTO 9Ø9
    Ø
 3Ø1 IF Z=ØGOTO 9Ø91
 3Ø2 IF C=1GOSUB 9ØØØ
 3Ø3 PRINT "  COMMAND:";BOX 55,-16,2Ø,7,1
    ;D=KP;IF D=48GOTO G
 322 T=T-1
 325 IF D=49GOTO 5Ø5Ø
 328 IF D=5ØGOTO 5Ø85
 33Ø IF D=51GOTO 5Ø6Ø
 335 IF D=52GOTO 5Ø8Ø
 34Ø IF D=53GOTO 5Ø9Ø
 345 IF D=54GOTO 6ØØØ
 35Ø IF D=55GOSUB 8Ø5Ø
 355 GOTO G
118Ø PRINT "STATUS:",;GOSUB 5ØØ5
4999 GOTO G
5ØØØ IF S<5ØPRINT "DOWN";IF S<1S=Ø;RETURN
5ØØ1 IF S>8ØØPRINT "    STRONG";RETURN
5ØØ2 IF S<4ØØPRINT "    FAILING";RETURN
5ØØ3 PRINT "    HOLDING";RETURN
5ØØ5 IF C=1&(2)=73;&(3)=73
5ØØ6 IF C=2&(2)=159;&(3)=159
5ØØ7 IF C=3&(2)=178;&(3)=178
5ØØ8 PRINT "ALERT STATUS:";RETURN
5Ø2Ø IF U>4ØØC=3;RETURN
5Ø21 IF U<2ØØC=1;RETURN
5Ø22 C=2;RETURN
5Ø5Ø INPUT " ADVANCE: "X;U=U-X;B=B+X;F=F-
    X;GOTO G
5Ø6Ø IF C>1PRINT " OUT OF RANGE!";GOTO H
5Ø7Ø INPUT " FIRE:"X;IF X>5ØPRINT " WEAPO
    NS OVERLOAD*";GOTO H
5Ø72 IF X>APRINT " PULL FUEL?";Y=KP
5Ø73 IF Y=32F=F-Xx2
5Ø74 IF Y=31X=A;IF X=ØGOTO G
5Ø75 A=A-X;IF A<1A=Ø
5Ø76 Y=RND (45)+2Ø;W=Y-X;IF W>ØPRINT " AB
    SORBED!";GOTO H
5Ø77 IF W<1PRINT " SOLID HIT!";Z=Z-1;U=RN
    D (5ØØ)+G;GOTO H
5Ø8Ø INPUT " FUEL TO SHIELDS:"X;S=S+X;F=F
    -X
5Ø82 IF S>I Y=S-I;S=I;F=F+Y
5Ø83 GOTO G
5Ø85 INPUT " RETREAT:"X;B=B-X;F=F-X;GOTO
    G
5Ø9Ø X=(5Ø-A);F=F-X;A=5Ø
5Ø91 IF F<ØS=S+F
5Ø92 GOTO G
6ØØØ INPUT " TO FUEL:"X;S=S-X;F=F+X;IF S<
    1F=F+S;S=Ø
6ØØ1 GOTO G
6Ø5Ø CY=16;PRINT " DOCKING IN PROGRESS";T
    =T-3;U=RND (5ØØ)+G;X=5Ø;GOSUB 6Ø6Ø
6Ø52 X=X-1;IF X=ØCLEAR ;GOTO 12Ø
6Ø54 GOTO 6Ø52
6Ø6Ø S=I;F=I;A=15Ø;K=Ø;J=Ø;RETURN
8Ø5Ø B=B-2ØØ;IF B<ØB=Ø
8Ø51 RETURN
9ØØØ X=RND (6);IF X=1PRINT " WE TOOK A HE
    AVY HIT!";S=S-2ØØ
9ØØ1 IF X=2PRINT " MED. HIT ABSORBED!";S=
    S-G
9ØØ2 IF X=3PRINT " RECEIVING LIGHT FIRE";
    S=S-5Ø
9ØØ3 IF S<ØCLEAR ;PRINT " HIT W/O SHIELDS
    !";GOTO 9Ø9Ø
9ØØ4 IF X=4PRINT " CYLONS RETREATING!";U=
    U+2ØØ
9ØØ5 IF X=5PRINT " FUEL STORAGE HIT!";K=K
    +1
9ØØ6 IF X=6IF S<9ØØPRINT " WEAPONS HIT!";
    J=1
9ØØ7 RETURN
9Ø6Ø X=1Ø
9Ø61 X=X-1;IF X=ØGOTO G
9Ø63 GOTO 9Ø61
9Ø9Ø PRINT " MISSION FAILED!";STOP
9Ø91 PRINT " MISSION ACCOMPLISHED!
```

PRINT STATEMENTS
A TUTORIAL
BY
FRED CORNETT

There are two ways to control what your computer prints on the screen:

1-"PRINT" We all know this one!
2-"TV=A" This is similar to the "$CHR" command found in other basics. The command "TV=A" will convert the ASCII value in Variable "A" to the appropriate ASCII character and print that character on screen. When using this command, refer to the ASCII chart in this issue.

If we wish to print using the "TV" command, it could be done thusly.

```
10 TV=KP
20 GOTO 10
```

That program however, does not save any information. To save information requires knowledge of how the ASCII characters are stored.

```
10 A=KP
20 TV=A
30 PRINT A
40 GOTO 10
```

After you have input this program & pressed "RUN-GO", press the letter "B".The computer will print " B 66". What the program is doing is this:

10 Take the ASCII numerical value of the character selected and store it in variable "A".

20 Print the ASCII numerical value stored in variable "A" as a character.

30 Print the ASCII numerical value stored in variable "A" as a numerical value only.

40 Do it all again.

If by this time, you are silently muttering "Who cares?", read on (It should get better).

Suppose we wanted to write a program that would ask our name and later use the name in a print statement. This time we will store our ASCII values in "String Arrays" and usa a "LOOP" to input the information, and another LOOP to retrieve that information.

```
10 PRINT "WHAT IS YOUR FIRST NAME?
20 FOR A=1TO 4
30 @(A)=KP
40 TV=@(A)
50 NEXT A
```

Lines 20 & 50 constitute a counting loop. When the computer executes line 20, it will set variable "A" to equal 1. When the computer executes line 50, it will in effect say GOTO 10 and add 1 to Variable "A"; The computer will continue this operation until the final number has been reached (in this case "4"). The lines in between 20 and 50 will be executed each time the LOOP passes from 20 to 50.

Let's try inputting the name "FRED", here is what will happen (PRESS F R E D):

```
20 A=1     20 A=2     20 A=3     20 A=4
30 @(1)=70 30 @(2)=82 30 @(3)=69 30 @(3)=68
40 TV=@(1) 40 TV=@(2) 40 TV=@(3) 40 TV=@(4)
```

We have stored FRED in @(1) through @(4)
Now, let's get than name back out, and use it within a print statement:

```
60 CLEAR
70 PRINT "HI ",
80 FOR A=1TO 4
90 TV=@(A)
100 NEXT A
110 PRINT "! WANT TO PLAY?
```

This loop will handle names using 4 or fewer letters; to alter the program to enable different sized names, change the second value in the loops on lines 20 and 80 (When inputting a 5 letter name in a six letter loop, add a space after final letter).

Have you noticed the comma after the print statement on line 70? This keeps the CURSOR on the same line it just printed, allowing the name to be printed after "HI " (when using the TV statement , the CURSOR will automatically stay on the same line).

NOTE: The only time you need the final quotes on a print statement is when additional commands follow the print statement (on the same line).

Now that we can control what we print, we need to be able to control WHERE we print. This done with CX (Column) & CY (Line) commands. Please refer to the CURSOR CONTROL TABLE provided. All locations shown on the chart provide standard character placement. If you wanted the word "HELLO" to be printed on Line 1,starting with position 1, it would be done:

```
10 CX=-77;CY=40
20 PRINT "HELLO
```

As in learning any subject, understanding only comes through application. For that reason, we have included the following "OTHELLO" (1 player) program. Play it and examine it, and your understanding will increase!!

F. Cornett

OTHELLO

BY

BRETT BILBREY

Object of Play: You outflank and convert the computers playing pieces (X) to your own (O) by placing your pieces (O) on both ends of the computers row, column, or diagonal. The computer takes the first turn. (The computer takes a fair amount of time to decide his play). When it is your turn, input Line # first, Column # second. You can skip a turn by inputting Ø Ø. Each move you make must be a flanking move or computer will reject your move!

```
  2 BC=125;FC=698;CLEAR ;PRINT "I'M X-ME
    FIRST";FOR X=ØTO 1ØØØ;NEXT X;NT=1
 1Ø CLEAR ;S=2;B=-1;W=1;Z=Ø;M=4;L=2;E=2
 11 FOR I=ØTO 9;FOR J=ØTO 9;@(Ix1Ø+J)=Ø;
    NEXT J;NEXT I;@(44)=W;@(55)=W;@(45)=
    B;@(54)=B
 2Ø @(1Ø1)=Ø;@(1Ø2)=-1;@(1Ø3)=-1;@(1Ø4)=
    -1;@(1Ø5)=Ø;@(1Ø6)=1;@(1Ø7)=1;@(1Ø8)
    =1
 3Ø @(111)=1;@(112)=1;@(113)=Ø;@(114)=-1
    ;@(115)=-1;@(116)=-1;@(117)=Ø;@(118)
    =1;GOSUB 44Ø
 4Ø C=W;H=B;A=-1;F=Ø;G=Ø;T=C;Y=H;FOR I=1
    TO 8;FOR J=1TO 8;IF @(Ix1Ø+J)#ØGOTO
    13Ø
 5Ø GOSUB 35Ø;IF Q=ØGOTO 13Ø
 6Ø U=-1;GOSUB 37Ø;IF R=ØGOTO 13Ø
 7Ø IF (I=Ø)+(I=8)R=R+S
 8Ø IF (J=Ø)+(J=8)R=R+S
 9Ø IF R<AGOTO 13Ø
1ØØ IF R>AGOTO 12Ø
11Ø X=RND (1Ø);IF X>5GOTO 13Ø
12Ø A=R;F=I;G=J
13Ø NEXT J;NEXT I;IF A>ØGOTO 16Ø
14Ø PRINT "I CAN'T MOVE";IF Z=1GOTO 31Ø
15Ø Z=1;GOTO 18Ø
16Ø Z=Ø;PRINT "I MOVE",F,"  ",G;I=F;J=G;
    U=1;GOSUB 37Ø;E=E+R+1;L=L-R;M=M+1;PR
    INT "I HAVE",R;GOSUB 44Ø
17Ø IF (L=Ø)+(M=64)GOTO 31Ø
18Ø T=H;Y=C;INPUT "YOUR MOVE"I,J;IF (I<Ø
    )+(I>8)+(J<Ø)+(J>8)GOTO 18Ø
19Ø IF I#ØGOTO 23Ø
2ØØ INPUT "FORFEITING YOUR TURN (Y=Ø,N=1
    1)"X;IF XGOTO 18Ø
21Ø IF Z=1GOTO 31Ø
22Ø Z=1;GOTO 4Ø
23Ø IF @(Ix1Ø+J)=ØGOTO 25Ø
24Ø PRINT "OCCUPIED SQUARE";GOTO 18Ø
25Ø GOSUB 35Ø;IF Q=1GOTO 27Ø
26Ø PRINT "BAD MOVE";GOTO 18Ø
27Ø U=-1;GOSUB 37Ø;IF R>ØGOTO 29Ø
28Ø PRINT "NO FLIP";GOTO 18Ø
29Ø Z=Ø;PRINT "YOU HAVE",R;U=1;GOSUB 37Ø;
    L=L+R+1;E=E-R;M=M+1;GOSUB 44Ø
3ØØ IF (E#Ø)+(M#64)GOTO 4Ø
31Ø PRINT "YOU HAVE",L;PRINT "I HAVE",E;I
    F L=EPRINT "TIE";GOTO 34Ø
32Ø IF L>EPRINT "YOU WON";GOTO 34Ø
33Ø PRINT "I WON
34Ø FOR X=ØTO 5ØØØ;NEXT X;GOTO 1Ø
35Ø FOR O=-1TO 1;FOR P=-1TO 1;IF @((I+O)x
    1Ø+J+P)=YGOTO 36Ø
355 NEXT P;NEXT O;Q=Ø;RETURN
36Ø Q=1;RETURN
37Ø R=Ø;FOR K=1TO 8;V=@(1ØØ+K);N=@(11Ø+K)
    ;D=I+V;@(12Ø)=J+N;@(121)=Ø;IF @(Dx1Ø+
    @(12Ø))#YGOTO 43Ø
38Ø @(121)=@(121)+1;D=D+V;@(12Ø)=@(12Ø)+N
    ;IF @(Dx1Ø+@(12Ø))=TGOTO 41Ø
39Ø IF @(Dx1Ø+@(12Ø))=ØGOTO 43Ø
4ØØ GOTO 38Ø
41Ø R=R+@(121);IF U#1GOTO 43Ø
42Ø D=I;@(12Ø)=J;FOR X=ØTO @(121);@(Dx1Ø+
    @(12Ø))=T;D=D+V;@(12Ø)=@(12Ø)+N;NEXT
    X
43Ø NEXT K;RETURN
44Ø CLEAR ;FOR I=1TO 8;FOR J=1TO 8;IF @(I
    x1Ø+J)=ØTV=45;GOTO 45Ø
441 IF @(Ix1Ø+J)=1TV=88;GOTO 45Ø
442 TV=79
45Ø TV=32;NEXT J;TV=I+48;PRINT ;NEXT I;FO
    R X=1TO 8;TV=X+48;TV=32;NEXT X;PRINT
    ;RETURN
```

BACK ISSUES

We have had numerous requests for info regarding BACK ISSUES! There are four available:

1. Jan. 80 Contains:Electric Bill Analysis; Plastic Puzzle; Instructions for adding a Full-sized ASCII Keyboard; Life Synthesis Model.
2. Feb. 80 Contains: PEEK n' POKE; Hex to Decimal Converter; String Array @(A) Memory Locator; Instructions on how to add a Printer; Bubble Sort; Camel; Memory Map; WUMPUS.
3. Mar. 80 Contains: Three Voice Music Assembler; Star Wars Music; Chopsticks; Chicago Loop; Lace Curtain; Character Set Size Multiplier; Rotation; National Distributor Info.
4. Apr./May 80 Contains: DMA Graphics (eliminates BOX & LINE commands, allows very complex graphics!);Reference Books; Product Review (Computer Ear-Speech Recognition Unit for Bally); Music Contest; RING; Alarm Clock; Byte Saving Hints

Send $1.60 per back issue desired to CURSOR PO Box 266, N. Hollywood, CA 91603

BYTESAVERS

If at the end of a program, you wish the program to run again, instead of using "GOTO 1Ø" use "RUN".

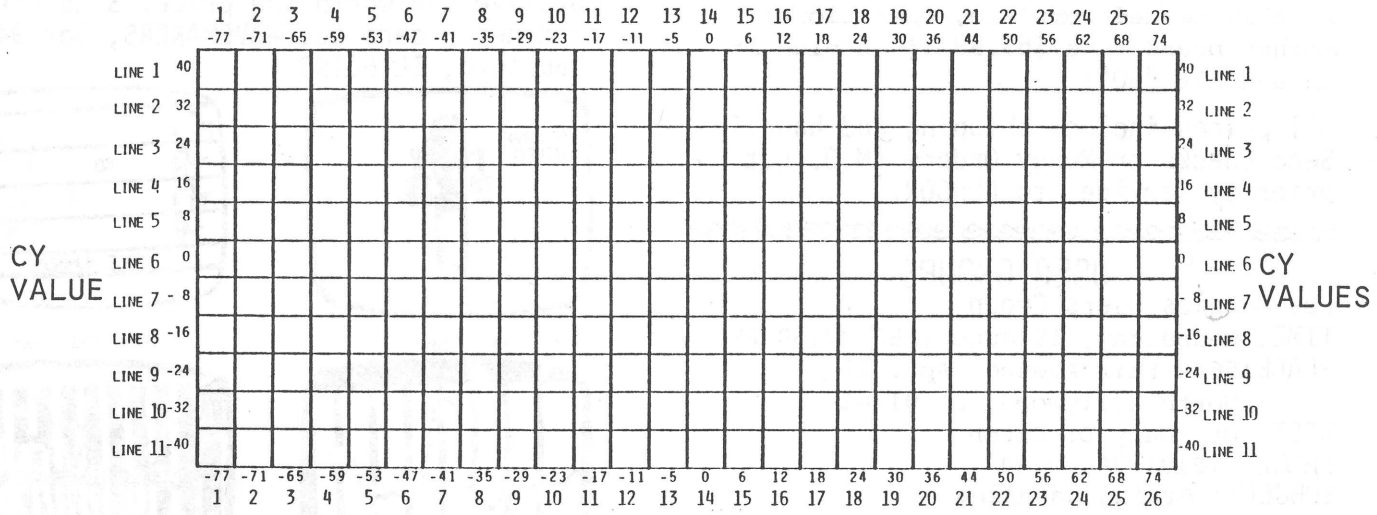
If you have used all 26 letter variables but you still need more, you can use "RM", as long as you aren't doing any division within the program.

ASCII CONVERSION CHART

ASCII	CHARACTER	ASCII	CHARACTER	ASCII	CHARACTER	ASCII	CHARACTER	ASCII	CHARACTER
13	GO(Carriage Rtn)	47	/	64	@	81	Q	98	x(Multiply)
31	ERASE	48	Ø (Zero)	65	A	82	R	99	÷
32	SPACE	49	1	66	B	83	S	1Ø4	LIST
33	!	5Ø	2	67	C	84	T	1Ø5	CLEAR
34	"	51	3	68	D	85	U	1Ø6	RUN
35	#	52	4	69	E	86	V	1Ø7	NEXT
36	$	53	5	7Ø	F	87	W	1Ø8	LINE
37	%	54	6	71	G	88	X	1Ø9	IF
38	&	55	7	72	H	89	Y	11Ø	GOTO
39	' (Apostrophe)	56	8	73	I	9Ø	Z	111	GOSUB
4Ø	(	57	9	74	J	91	[	112	RETURN
41	)	58	:	75	K	92	\	113	BOX
42	*	59	;	76	L	93	]	114	FOR
43	+	6Ø	<	77	M	94	↑	115	INPUT
44	, (Comma)	61	=	78	N	95	←	116	PRINT
45	- (Dash)	62	>	79	O	96	↓	117	STEP
46	. (Period)	63	?	8Ø	P	97	→	118	RND
								119	TO

CURSOR CONTROL CHART

CX VALUES



1. Bally On-Board ROM Sub-Routines. Explains the use of the on-board routines which allow you to perform such things as you find in the "Machine Language Programs" in Cursor. Includes ASCII Standard & Nonstandard Character Sets, Cassette Memory Structure; Output Ports; Input Ports; Bally Data Base Locations; Bally Memory Locations; and On-Board ROM 8K Hex Dump. $3.50 (+ 25¢ 1st Class Postage).

NOTE: ALL PRINTED MATTER SENT 3RD CLASS UNLESS YOU DESIGNATE OTHERWISE!

2. Hackers Manual. Describes features provided in the Tiny Basic but not documented in the Bally Instruction Booklet (Additional Commands). $2.95

3. Disassembled Tiny Basic (CDOS Z80 Assembler Version 02.15). A complete assembly language listing including OP Code and comments of the Tiny Basic Cartridge. $6.50 (+ 45¢ First Class Postage)

4. Disassembled Brickyard & Clowns. A complete assembly language listing including OP Code and comments. $6.95 (+ 45¢ for 1st Class Postage).

5. Disassembled DEMO Cassette. A complete assembly language listing including OP Code and comments. $6.50 (+ 45¢ First Class Postage).

6. BALLY System Description Book. Extensive and includes "Electrical Specifications for Midway Custom Circuits", Timing, Interrupt handling explanations, etc. $6.95 (+ 45¢ First Class Postage).

7. Disassembled System Software. A complete assembly language listing including OP Code and comments to include: Home Video Game Equates; Port Equates; System Call Indexes ;Macros; Music Macros; Music Equates; System RAM Memory Cells; User Supplied Routines; Masks; UPI Routine Address Tables; Sentry; BCD Divide; BCD Subtract & Add; Decrement Counters & Timers; Music CPU; Vectoring Routines; Paint Rectangle Routine; Write Routines; Character Display Routines; Display BCD; Menu Routines, and much, much more. $10.50 (+ $1.00 First Class Postage).

8. Disassembled On-Board Games. A complete assembly language listing including OP Code and comments to include: Scribbling, Calculator, Checkmate, Gun Fight. $11.95 (+ $1.45 First Class Postage).

9. Bally Service Manual. Schematics, Parts Lists, instructions for removing RF Shields, and much more. No one should be without it!! $2.75

CLASSIFIEDS

MOTHER BOARDS

A Mother Board is the printed circuit board containing all the electronic parts (Chips and all) of the Bally unit except the RF Modulator, The plastic case, and the hand controls.

We have found a source that will sell these boards to CURSOR in quantity (provides you with a cheaper price then if you were to deal direct), but will ship the board direct to you. $24.99 will get you a Salvage Board which has problems generally consisting of poor connections, a bad chip, or 1-2 missing components. With Custom Chips running $34.00, the salvage board is a great buy. If you buy two salvage boards, every effort will be made to ship you two boards each having different problems.

A fully tested complete, operational mother board runs $69.99 (just plug it in and hit "GO").

All prices include shipping and handling. Send checks or Money Orders (M.O. get priority service) to CURSOR.

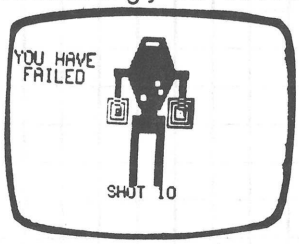
USER GROUPS

Los Angeles Users Group
TIME: Wednesday, 18 June 1980 7:30 PM
PLACE: 5640 Fair Avenue, Apt. 21
North Hollywood, CA 91601
HOST: Mr. Gary D. Caton
PHONE: (213) 763-0734
SUBJECT: String Handling

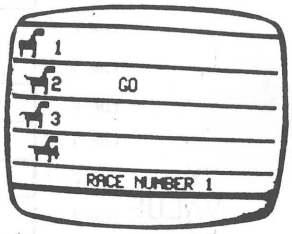
Jim Coughlin of Washington D.C., is starting up a USER GROUP; If you want to get together with a group of fellow Bally owners, and get some answers to some of the questions you can't seem to get answered, or if you would like to trade programs, that is what a USER GROUP IS for. Contact: Jim Coughlin, 1915 Naylor Rd., W.E., Washington D.C. 20020. Phone: Home-(202)678-4972 or use toll free # during work hours 800-638-8030.

*WaveMakers, games for Bally©system

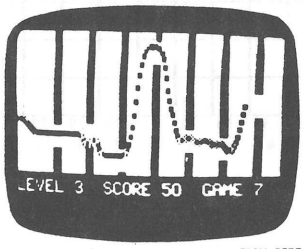
The following photographs depict two tapes currently being offered by Wavemakers at $6.95 + 50¢ Postage. All programs include typed listings. We at CURSOR have seen these programs and feel that they are innovative and worth the price. Send Checks or Money Orders to: WAVEMAKERS, Box 94801, Shaumburg, IL 60193



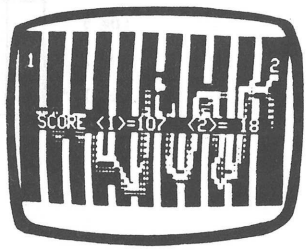
SIDE 1 -MAX-



SIDE 2 -HORSE RACE-



-OBSTACLE COURSE- ALSO FROM SIDE 1



SIDE 1 -MAZE RACE-

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FIRST CLASS